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# RIVER BASIN MANAGEMENT AND THE WATER FRAMEWORK DIRECTIVE: IN NEED OF A LITTLE HELP?

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## INTRODUCTION

The EU Water Framework Directive (WFD)<sup>1</sup> is now in the second half of its 15-year implementation period and the draft river basin management plans (RBMP) have just been published for public comment.<sup>2</sup> The process has been arduous, especially in jurisdictions such as Scotland where there was previously no comprehensive system of river basin planning. Partly as a result of this low starting point, and partly as a result of political and regulatory will, Scotland has taken the opportunity to move ahead with transposition earlier than the directive timetable required. It has gone beyond the scope of the directive, replacing outdated rules and giving effect to the spirit, rather than the letter, of the law.

The WFD has been implemented in Scotland through primary legislation, the Water Environment and Water Services (Scotland) Act 2003 (WEWS),<sup>3</sup> as well as through detailed regulations. The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR)<sup>4</sup> provide a proportionate and integrated licensing regime for all uses of the water environment – abstractions, impoundments, discharges and river works – and include controls on diffuse pollution within the lowest tier of General Binding Rules.<sup>5</sup>

This article examines the progress of the WFD, and particularly river basin planning, in the context of wider policy for water resources management, and in relation to the pre-existing initiative of the global UNESCO programme, Hydrology, Environment, Life and Policy (HELP). HELP is a stakeholder-focused cross-cutting programme within the UNESCO International Hydrological Programme. It integrates cutting-edge science with effective policy and law, and addresses the 'paradigm lock' of poor communication between different professionals, and between professionals and various stakeholder groups, in any particular river basin.

Concepts of integrated water resources management, typified by the WFD in Europe, and related principles of good water governance, are also considered. The article looks at the Tweed river basin on the Scottish-English border, a candidate HELP basin where there is much good practice, and at proposals for more use of natural flood management techniques as a good example of the tensions between science, policy and law, and stakeholder interests. It concludes with some reflections on the future global role of the HELP programme, and its relationship to the WFD and similar instruments.

## INTEGRATED WATER RESOURCES MANAGEMENT

Integrated water resources management (IWRM) is a policy, and increasingly a legal concept, that recognises the interdependency of water and land use management and the necessity of a stakeholder-oriented approach to reconcile competing interests and achieve multiple outcomes. It is effectively synonymous with terms such as 'integrated river basin management', 'integrated land and water resources management' or 'integrated watershed management'. The classic definition comes from the Global Water Partnership:

a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.<sup>6</sup>

At a minimum, IWRM would recognise the coherence of a planning structure based on hydrological (river

\* The UNESCO Centre is the regional coordinating unit for the European HELP basins. Thanks to those colleagues, inside and outside the Centre, who read and otherwise contributed to this article, especially Prof Alan Werritty, Dr Tom Ball and Luke Comins of the Tweed Forum; any errors and misconceptions remain the author's own.

1 Council Directive 2000/60/EC of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy [2000] OJ L327 (the Water Framework Directive).

2 The deadline for the first draft plans under the directive was 22 December 2008, allowing one year before final publication. Draft river basin management plans for the Scotland River Basin District and the Solway Tweed River Basin District, with supporting documents, are available at [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx) (13 January 2009).

3 Water Environment and Water Services (Scotland) Act 2003 asp 3 (WEWS). For an analysis of the introduction of WEWS and how it went beyond the WFD see S Hendry 'Enabling the Framework: the Water Environment and Water Services (Scotland) Act 2003' (2003) 14 WL 16.

4 Water Environment (Controlled Activities) (Scotland) Regulations 2005 SSI 2005/348 (CAR). For an analysis of CAR, see B Clark 'Water Use Reform in Scotland: a Critical Analysis' (2006) 18 JEL 375.

5 The General Binding Rules are in sch 3 of CAR, and apply to activities, usually small scale, that will have a minimal effect on the water environment. The other tiers are registration, for activities with potentially cumulative effects such as septic tanks, and licences, for the most potentially hazardous activities. Regulation 11 empowers SEPA to impose a higher level of authorisation if necessary to protect the water environment.

6 Global Water Partnership Technical Advisory Committee 2000 TAC Background Paper No 4 'Integrated Water Resources Management' <http://www.gwpforum.org/servlet/PSP?iNodeID=215&itemId=24> (28 November 2008).

basin) boundaries rather than pre-existing administrative structures, and would recognise the inter-dependence of the water cycle. The latter would at least treat surface water and groundwater holistically, and might also include estuarine and coastal waters (as does the WFD) and wetlands (as does the Scottish implementation).

IWRM has been an international policy goal since at least 1992, and is expressed in Agenda 21,<sup>7</sup> and more recently, the Johannesburg Declaration and Plan of Implementation.<sup>8</sup> It is being implemented in many parts of the world; the WFD is only one, albeit a comprehensive and sophisticated, example of a legislative framework for this type of approach to managing water.<sup>9</sup> This concept of an integrated approach, and the need to work with a diverse range of disciplines and interested parties, has been a staple part of the field work of engineers, hydrologists and physical geographers for decades.<sup>10</sup> Many states are implementing their international commitments by reforming their legal structures for water resources management. Nonetheless, widespread recognition of the concept is relatively modern and in many places, not just the developing world, it has proved both complex and expensive to put into practice. This has led some to cast doubt on its efficacy, or at least whether other, operational aspects of water reform (particularly the reform of water rights and allocations, the most politically and socially sensitive area) would be a better use of scarce resources.<sup>11</sup> Law is one of the disciplines that has a role to play in IWRM, and in recent years has acquired more prominence, both in creating structures for IWRM and in the reform of the operational areas, especially water rights and water quality.

Most commentators accept the desirability of an integrated approach, and some argue that IWRM has attained the status of a legal norm.<sup>12</sup> If nothing else, it provides a framework whereby policy-makers in other related areas, such as land-use planning in its broadest sense, will be required to recognise the impacts of wider land-use patterns and socio-economic activities on the water resource, and gives those policy-makers the data on which to make the necessary tradeoffs between economic, social and environmental needs. In turn, this requires stakeholder understanding and acceptance of the science behind the law. If, as is usually the case, the IWRM process results in some plan or strategy being formed, this will provide the

opportunity to make those tradeoffs explicit and to set out challenging, but realistic, targets and goals. One element of the development of an IWRM approach and one which is a particular focus of HELP is the relationship between science and law into policy. As new scientific understanding develops, for example in hydrology or water quality, this new knowledge needs to be incorporated effectively into the legal regimes.

## CRISIS, WHAT CRISIS?

To say there is a world water crisis is trite, yet the 'headline' figures are well known – more than one billion people without adequate drinking water supplies, more than two and a half billion without adequate sanitation.<sup>13</sup> Of the top five communicable diseases worldwide, two – diarrhoea and malaria – are directly linked to water, and all are affected by the lack of sufficient water and especially, sanitation.<sup>14</sup> As many as one third of all deaths in developing countries are linked to water and sanitation, and up to 80 per cent of disease.<sup>15</sup> Figures for morbidity, that is for on-going illness and debility, are harder to quantify than for mortality<sup>16</sup> but there is a disproportionate effect on populations in sub-Saharan Africa and in Southern Asia, and globally, those living in extreme poverty – again, more than one billion people fall into this category.<sup>17</sup> Lack of a water supply also disproportionately affects women, children and the elderly, while better provision directly affects social and economic well-being, enabling more time to be spent on productive activities and more girls to attend school. The global population is increasing,<sup>18</sup> and so are the pressures on the resource. Approximately one third of the world's population lives in countries that are water stressed, and this is predicted to increase to more than half by 2025.<sup>19</sup>

These problems require a fresh approach to water management, which IWRM and the HELP programme can provide. These new approaches will require, inter alia, a programme of law reform.

## THE UNITED NATIONS AND THE ROLE OF UNESCO

The UN Educational, Scientific and Cultural Organisation (UNESCO) is one of 25 UN agencies working on

7 'Agenda 21 An Agenda for the 21st Century' A/Conf 152/126 para 18.3. <http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm#sec2> (21 January 2009).

8 UN 'Report of the World Summit on Sustainable Development' (2002) A/Conf 199/20 incorporating the Johannesburg Declaration and Plan of Implementation para 26 available at [http://www.un.org/esa/sustdev/documents/WSSD\\_POI\\_PD/English/POIToc.htm](http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIToc.htm) (21 January 2009).

9 For a comparative analysis looking at Scotland, England, Queensland and South Africa, see Hendry 'Integrated Water Resource Management: Comparative Frameworks for Reform' (2006) 17 WL 47–60.

10 S Saha, C Barrow (eds) *River Basin Planning Theory and Practice* (J Wiley and Sons London 1981).

11 FAO Legislative Series 92 *Modern Water Rights Theory and Practice* (FAO Rome 2006) ch 5.

12 S Salman, D Bradlow *Regulatory Frameworks for Water Resources Management* (World Bank Washington DC 2006) s 3.2.

13 UNDP 'Human Development Report 2006 Beyond Scarcity: Power Poverty and the Global Water Crisis' (2006) p 5 <http://hdr.undp.org/hdr2006/> (21 January 2009). These figures were originally produced by WHO/UNICEF 2000 in 'Global Water Supply and Sanitation Assessment' [http://www.who.int/water\\_sanitation\\_health/monitoring/globalassess/en/](http://www.who.int/water_sanitation_health/monitoring/globalassess/en/) (21 January 2009) and remain broadly valid in an area where data is always problematic.

14 UN 2006 'Water A Shared Responsibility' p 20 <http://www.unesco.org/water/wwap/wwdr/wwdr2/> (21 January 2009).

15 'Agenda 21' (n 7) para 18.47.

16 The UN and other agencies are developing the concept of the Disability Adjusted Life Year to try and quantify these effects; see 'Water A Shared Responsibility' (n 14) 208.

17 *ibid* ch 6.

18 *ibid* p 7; currently 6.4bn, and predicted to rise to 8.9bn by 2050.

19 IPCC 2001 'Climate Change 2001 Working Group II Impacts Adaptation and Vulnerability' para 3.1 [http://www.grida.no/climate/ipcc\\_tar/wg2/005.htm](http://www.grida.no/climate/ipcc_tar/wg2/005.htm) (21 January 2009).

water.<sup>20</sup> These agencies each address different parts of the water problem, social and environmental, while working together in a partnership, UN-Water, which recognises the complexity of the problem. UN-Water has four specific programmes: the World Water Assessment Programme, the UN-Water Decade Programme on Capacity Development, the UN-Water Decade Programme on Advocacy and Communication, and the WHO-UNICEF Joint Monitoring Programme on Water and Sanitation. The World Water Assessment Programme has inter alia produced the World Water Development Reports, the third of which was released at the Fifth World Water Forum in Istanbul in March 2009.<sup>21</sup> UN-Water also engages with many non-UN partners, working in time-limited programmes and task groups. The Third World Water Development Report will recognise the role of law and governance in water management.

UNESCO's scientific mission includes the International Hydrological Programme (IHP).<sup>22</sup> The IHP, UNESCO's international scientific cooperative programme in water research, water resources management, education and capacity-building, is now in its seventh strategic planning phase, from 2008–2013. The 7th strategic plan has five key themes: Adapting to Global Change; Water Governance for Sustainability; Ecohydrology; Water and Life Support; and Water and Education. The IHP is a vehicle for governments, scientific and professional organisations, and other stakeholders to work together on both the scientific and social aspects of better water management. Under the auspices of UNESCO, a Category 2 Centre has for the first time been established at the University of Dundee, specialising in water law and the relationship between law, policy and science, and is actively engaged in the HELP programme as well as other IHP activities, again recognising the role of law as one part of the change agenda. The IHP has a number of associated programmes, including two cross-cutting programmes that affect all aspects of the work of the IHP, HELP and Flow Regimes from International Experimental and Network Data (FRIEND).

FRIEND is intended to improve knowledge and understanding of hydrology at a regional level by the exchange of data and techniques, and is based on expertise in the water sciences.<sup>23</sup> The HELP programme, which is the focus of this article, is a little different. It offers insights into good practice for water management that include, but go beyond, scientific analysis, and it includes multi-dimensional stakeholder activities as a core part of IWRM.

## HELP, GOOD GOVERNANCE AND THE WATER FRAMEWORK DIRECTIVE

The negative consequences of poor water management in relation to health have been outlined above, and a similar exercise could easily be carried out in relation to the environmental consequences of waste and pollution of the water resource. However, we should not fail to consider the huge social and economic, as well as environmental, benefits of better water management. Access to water improves personal and public health, facilitates education, especially of girls, enables subsistence farmers to improve their living standards, and ultimately results in more efficient practices that use less water for better results. Good environmental management, improved irrigation practices, better access to drinking water and sanitation, and better management of waterborne waste require not only changes to the physical management of water by experts and professionals but also education, information and a host of development activities to improve understanding and change behaviour. Although the problems and level of criticality are different, this is equally true in the developed and developing worlds.

As is apparent from the introduction to IWRM above, the concept extends beyond both the classic areas of water law and policy (water rights and allocation, water quality and pollution control, etc) and the preserve of hydrologists and engineers in the physical management of the resource. As well as being an integrative concept that addresses all aspects of the hydrological cycle and the relationship between water and land use, it is also an approach that requires attention to ideas of governance that are increasingly prevalent in the world of water.<sup>24</sup> While the natural and physical sciences are an essential element of water management, so too are the social sciences, including law and economics as well as political science; governance is highly relevant to these areas of study, involving as it does accountability, transparency and equity in decision-making by governments and other actors. Concepts of good water governance, or good governance in water, also link to the fundamental themes and ideas of the sustainable development agenda, especially the integration of the economic, social and environmental dimensions of development and the need for equity both within and between the generations. Good governance is integral to effective IWRM, and is of particular importance to water rights and allocation, especially in communities where law reform is overlaying established customary rights to water.<sup>25</sup>

To return to the WFD<sup>26</sup> and the draft RBMPs, the process has involved an economic characterisation of water use, showing the various sectoral users of water

20 For an introduction to UN-Water, the partnership of UN agencies involved in water, see <http://www.unwater.org/members.html> (13 January 2009).

21 For information on the Fifth World Water Forum, see <http://www.worldwaterforum5.org/> (13 January 2009).

22 For more information on the IHP, see <http://typo38.unesco.org/index.php?id=240> (13 January 2009).

23 For information on FRIEND, see <http://typo38.unesco.org/en/about-ihp/ihp-partners/friend.html> (13 January 2009).

24 For a recent review of governance literature in a water context, see P Wouters 'Global Governance through Many Lenses' *Global Governance* 14 (2008) 523–34.

25 For some general discussion of the complex and problematic relationship between customary law and reformed water legislation, see B van Koppen, M Giordano and J Butterworth (eds) *Community-Based Water Law and Water Resource Management Reform in Developing Countries* (CAB International 2008).

26 Water Framework Directive (n 1).

in a basin, while the plans themselves must be developed with the input of key stakeholders and the encouragement of the general public.<sup>27</sup> These provisions link to both sustainable development and themes of governance. The active involvement of stakeholders, whether or not in a water context, is one mechanism to prevent the capture of development agendas by those already exercising political and economic power, while at the same time facilitating transparency and accountability in decision-making. These ideas are central to IWRM and they are also central to the HELP initiative.

### A LITTLE HELP?

HELP has sought to provide a new global and regional approach to water resources which both engages with the diverse range of stakeholders in a basin, and creates an interface between science and law and policy.<sup>28</sup> The WFD is an excellent example of a legal instrument that seeks to incorporate the best new science, in this case relating to the ecological quality of river basins, into a legal regime. This process is the ideal of modern environmental law – that the policy, implemented by law, should reflect that sound science and embed it in the behaviours and practices of institutions and individual users alike. Yet the process is fraught with difficulty, including the long timeframes for law reform and the possible reluctance of stakeholders to accept not just the word of politicians but also the authority of scientists. Although these problems of social attitudes and beliefs are beyond the scope of this article, the need to integrate law and policy frameworks with sound science is not, and is also at the heart of the HELP agenda.

The HELP programme was established in 1999 under the leadership of Professor Mike Bonell, then Chief of Section: Hydrological Processes and Climate at UNESCO, and HELP's global coordinator in its early years. HELP focuses on river basins as the appropriate unit of management, and is a network of basins, some at a developmental stage, others far advanced in the implementation of IWRM principles. Many HELP basins are involved in other national or international water management programmes but all have, as a minimum, two common features: they involve stakeholders in the identification of key water management issues in the basin, and their catchments provide an opportunity for the joint study of the physical, social, legal and policy factors that affect that management. HELP seeks to undo the 'paradigm lock' – whereby scientists, policy-makers and legislators are each locked into their disciplinary silos, speaking a different language, and no group is effective at communicating with non-expert stakeholders in the basin.

When HELP was established, it utilised an invited network of 25 basins. There was subsequently a second phase, in which the programme was expanded to include 67 basins, organised into five regions –

Europe, North America, Latin America and the Caribbean, Australasia and South East Asia, and Africa. Each region, with the exception of Africa, currently has a regional coordinator's unit, and the global coordinator, Professor Shahbaz Khan, is located at UNESCO Paris.<sup>29</sup> Of the 67 basins, 20 were in greater Europe and seven within the United Kingdom, including one – the Oona/Blackwater – which crosses the Irish border, and is therefore an international river basin district for the purposes of the WFD.

HELP is now entering its third phase; at the time of writing there has just been another global call for basins to participate, to be undertaken in tandem with a review of the existing basins. In order to apply to join the programme, or to have its status reviewed, a basin organisation completes the necessary paperwork within evaluation criteria established by the global and regional coordinators and external panel members. These criteria fall within the following categories: suitability; relevance; adequacy and feasibility; commitment (to cooperation, and to providing resources); and contribution to HELP values. There is likely to be a functioning basin agency or organisation before HELP status becomes an option. This does not need to be a governmental body, indeed it may be preferable if the lead is taken by a non-governmental stakeholder body, but it will need to have good links with relevant public agencies and regulators. In this current call, which has just been evaluated, there are three new basins within the United Kingdom, the Tweed and the Dee in Scotland, both of which have highly effective catchment management structures now working within the WFD framework, and the Don in England. Although the evaluation process is not quite complete, it is expected that there will be a somewhat smaller network of around 46 basins in all, allowing a more manageable network and facilitating inter-basin linkages within and across the HELP regions.

UNESCO is not a regulator, and although like many UN agencies it may take the lead in developing relevant international conventions it is not really a law-maker in any conventional sense. In water as in other substantive areas, law must be formulated and applied at national or sub-national level, including the implementation of relevant international agreements. Unlike a river basin district under the WFD, the HELP basins are not necessarily statutory basin agencies with formal legal powers and duties under any national water resources law, but the two may coincide, and as IWRM and river basin planning become more common across the world, it is likely both that water law itself will be reformed, to provide for IWRM and for more effective operational mechanisms to control access to and use of water, and that non-statutory bodies will metamorphose into bodies with at least statutory functions. Stakeholder-led basin organisations are a very effective tool for these activities and, ideally, law reform along these lines will build on and develop the work of such bodies.

<sup>27</sup> *ibid* art 14.

<sup>28</sup> J Wallace and P Wouters (eds) *Hydrology and Water Law – Bridging the Gap* (IWA Publishing 2005).

<sup>29</sup> For information and contact details on the regional coordinators, and links to the basin sites, see <http://typo38.unesco.org/en/about-ihp/ihp-partners/friend.html> (13 January 2009).

## CATCHMENT MANAGEMENT IN THE TWEED RIVER BASIN

The Tweed river basin is located in the south east of Scotland and the north east of England, and is therefore a cross-border basin. It plays a key role in the WFD process and has applied, and recently been accepted, as a HELP basin. It offers useful lessons both in stakeholder work and governance, and in the debate over the relationship between science and law.

For WFD purposes, the Tweed basin is part of the Solway-Tweed river basin district (RBD), which is also cross-border both for the Tweed and the Solway. Although it is not an international river basin district under the WFD,<sup>30</sup> the water laws of England and Scotland are not the same, and this needs to be accounted for in the development of the RBMPs. As well as pre-existing differences, for example in water pollution law,<sup>31</sup> the WEWS Act goes beyond the WFD in various ways.<sup>32</sup> This is not the case in England and Wales,<sup>33</sup> so there is a separate set of regulations for this RBD which take account of these differences.<sup>34</sup> Similarly, and linked both to the diverse legal regimes and the different policy and management frameworks, the plan-making process is not quite the same in Scotland as in England and Wales. In the Solway-Tweed, the lead agency for the RBMP is the Scottish Environment Protection Agency (SEPA), not the Environment Agency of England and Wales, but unlike the Scotland RBD, SEPA must work closely with the Environment Agency in drawing up and then implementing the basin plan. Directions have been issued requiring cooperative working and in future a more fully integrated way of working between the two agencies.<sup>35</sup>

In Scotland, prior to the WFD, there was no systematic provision for river basin organisation, but there were and are a number of catchment management activities and organisations in some river basins, which may have had functioning catchment plans and are likely to

play a lead role in the area advisory groups. These groups have been set up in the eight areas within the Scotland River Basin District, and three areas within the Solway-Tweed River Basin District. They represent appropriate stakeholders in those sub-basin areas, and are working with SEPA and, where appropriate, the Environment Agency to develop and then implement the RBMPs. This has included producing area management plans. One of the ways in which the WEWS Act exceeded the requirements of the WFD was to make these sub-basin plans, optional under the directive, mandatory in Scotland.<sup>36</sup>

One such pre-existing organisation is the Tweed Forum, which had already produced a catchment management plan for the basin<sup>37</sup> and is now a major player in the area advisory group. The Tweed Forum brings together many different stakeholder groups in the public and private sector and has been working with its partners since 1991. Its objective is: 'to promote the sustainable use of the whole of the Tweed catchment through holistic and integrated management and planning'.<sup>38</sup> This does not refer to the planning and management of water only, as water management is affected by land-use patterns.

Land use in the Tweed is not unusual for a catchment in rural Scotland (or northern England), with 75 per cent of land used for agriculture and much of the rest for forestry. The Forestry Commission is a key player, both as policy-maker and landowner. Textiles, once a major industry, have made some recovery here, and tourism is a major activity. The principal local authority is the Scottish Borders Council, but its area extends a little further west into Scotland, and of course does not include the English portion, which falls within Berwick-upon-Tweed Council; this is the classic dichotomy between administrative and hydrological boundaries. One effect of this is that relevant data may be available within the local authority area, and for the whole river basin district as the RBMPs develop, but not necessarily for particular sub-basins or catchments. There are a number of small towns with populations between 5000–10,000. Urban flooding is an issue in several communities and 11 flood prevention schemes are in existence, with two more proposed after feasibility studies in seven possible locations.<sup>39</sup> Urban flooding brings significant and long-lasting social and economic problems<sup>40</sup> and may cause urban stakeholders to be receptive to properly-disseminated proposals for changes in upstream land and water management. There is currently a Flood Risk Management Bill<sup>41</sup> before the Scottish Parliament, which has

30 Water Framework Directive (n 1) art 3(3) establishes international river basin districts where the hydrological basin cuts across state borders. If all the transboundary basin states are EU Member States, all must cooperate in producing a river basin management plan. If there are non-Member States involved, they should be invited and encouraged to cooperate; art 3(5).

31 Before the WEWS Act (n 3) and the CAR regulations (n 4), the law in Scotland was contained (still) in the Control of Pollution Act 1974 c 40 Part II, while in England the Water Resources Act 1991 c 56 applied. There were, and are, significant differences in abstraction controls, as well as the management of water services.

32 WEWS (n 3) and CAR (n 4) manage pollution out to a three-mile limit from the coast, not the one mile specified by the Water Framework Directive; WEWS and CAR provide an integrated regime for all water uses including river works; WEWS requires the mandatory production of sub-district plans; the regime applies to wetlands.

33 Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 SI 2003/3242.

34 Water Environment (Water Framework Directive) (Solway Tweed RBD) Regulations 2004 SI 2004/99. The Northumbria RBD is also technically a cross-border basin and has its own regulations, but as only a few associated groundwaters lie in the Scottish territory there is little need for complex guidance on partnership working. In this district the lead is taken by the Environment Agency.

35 Scottish Government 2008 'Implementing the Water Environment (Water Framework Directive) (Solway Tweed River Basin District) Regulations 2004: River Basin Management Planning in the Solway Tweed River Basin District: Guidance' <http://www.scotland.gov.uk/Publications/2007/12/05141702/0> (13 January 2009).

36 Area plan for Tweed.

37 See generally and for the Catchment Plan and its update <http://www.tweedforum.com/> (23 January 2008).

38 *ibid* main page.

39 Scottish Borders Council 2007 'Technical Services Flood Prevention Report' <http://www.scotborders.gov.uk/council/departmentsandservices/technicalservices/majorprojects/11612.html> (22 January 2008).

40 Werriety and others 'Exploring the Social Impacts of Flood Risk and Flooding in Scotland' (Scottish Executive Publication 2007). <http://www.scotland.gov.uk/Publications/2007/04/02121350/0>.

41 Flood Risk Management (Scotland) Bill 2008 SP Bill No 15 (Floods Bill) <http://www.scottish.parliament.uk/s3/bills/15-FloodRisk/index.htm> (13 January 2009).

the potential to make a significant difference both to the management of urban flooding and the approach to upstream flood management in rural catchments.

The Tweed is a major salmon river, with 15 per cent of the UK's spawning grounds for Atlantic salmon. Land-owners with salmon fisheries are powerful stakeholders and both the Tweed Foundation and the River Tweed Commissioners are part of the Forum.<sup>42</sup> Waters in the basin are salmonid waters, to which special protection applies; SEPA may restrict river works in order to protect spawning grounds and nurseries. There are extensive Natura2000 sites in the Tweed basin under the Birds<sup>43</sup> and Habitats<sup>44</sup> Directives, which are 'protected areas' under the WFD,<sup>45</sup> as well as Ramsar sites<sup>46</sup> and multiple sites of national designation. Thus the Tweed provides ecosystem services of considerable environmental, social and economic benefit, while the Tweed Forum is a model of good practice for engaging basin stakeholders of many types and is itself increasingly engaged in statutory processes. The Tweed is an ideal candidate for a HELP basin.

#### NATURAL FLOOD MANAGEMENT – IN NEED OF SOME HELP?

The Tweed Catchment Management Plan and its review in 2006, along with ongoing work in the basin, identify six critical policy areas which are certainly not unique: water quality, particularly rural diffuse pollution; water resources; tourism and recreation; flood management; river works; and protection of habitats and species. Flood management is seen as especially important, with research work underway in the catchment on natural flood management as well as hydrological research. Natural flood management is a matter of much interest in Scotland at present, where the Flood Risk Management (Scotland) Bill<sup>47</sup> has just completed stage 1 of its committee procedure, implementing the Floods Directive<sup>48</sup> but also reviewing the wider national law frameworks, many of which are outdated. The bill includes the following provision, expanded at stage 2 to meet the concerns raised at stage 1:

SEPA must, by 22 December 2013 or such other date as the Scottish Ministers may direct, assess whether alteration (including enhancement) or restoration of natural features and characteristics of any river basin or coastal area in a flood risk management district could contribute to the management of flood risk for the district.

42 The Tweed Foundation is a charitable organisation, set up by the statutory River Tweed Commission to collect scientific data for the purpose of monitoring and improving fish stocks on the Tweed and its tributaries; <http://www.tweedfoundation.org.uk/> (13 January 2009).

43 Council Directive 1979/409/EEC on the Conservation of Wild Birds (Birds Directive).

44 Council Directive 1992/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora [1992] OJ L 206 (Habitats Directive).

45 Water Framework Directive (n 1) arts 6, 7 and Annex IV.

46 Protected under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971 11 ILM (1972) 963(Ramsar).

47 Floods bill (n 41).

48 Council Directive 2007/60/EC on the Assessment and Management of Flood Risks [2007] OJ L 288/27.

For the purposes of subsection (1), natural features and characteristics include such features and characteristics which can assist in the retention of flood water, whether on a permanent or temporary basis, (such as flood plains, woodlands and wetlands) or in slowing the flow of such water (such as woodlands and other vegetation), those which contribute to the transporting and depositing of sediment, and the shape of rivers and coastal areas.<sup>49</sup>

In its Stage 1 Report, the Committee for Rural Affairs and the Environment had reiterated its support for the concept, calling for a 'culture shift' and for provision in the bill to require local authorities (who will implement specific flood management projects in their areas) to consider the possible contributions identified by SEPA and to justify any failure to put these into effect.<sup>50</sup>

The contribution of natural flood management to the management of downstream flood risk is a topic of much debate among hydrologists, land managers, governments and curious academics, to mention only a few. The use of wetlands or other flood plain modifications has many advantages and is increasingly common in policy documentation,<sup>51</sup> although it may not always be appropriate and cannot manage the consequences of every flood, however severe.<sup>52</sup> To the extent that it may be useful, there are a number of related problems of acceptability in implementation.

First, land must be available at a suitable point upstream and the owners of that land must be willing to divert it to a non-productive use, or at least, to use it in ways which are not flood-critical. At times of rising cereal prices, and with inevitable restrictions on support for farmers and other rural landowners, this is unlikely to be the case.

Secondly, all the relevant institutional actors must be convinced of the efficacy of the scheme. SEPA's consent may be required under CAR; possibly local authorities will be asked to contribute to costs – or they may be relevant landowners – so they too must believe that the scheme will be effective, especially in preventing flood risk in downstream urban areas. Furthermore, every individual involved – whether as an employee, a member of an institutional stakeholder,

49 Floods bill (n 41) cl16(1),(1A).

50 Rural Affairs and Environment Committee 1st Report 2009 (Session 3) 'Stage 1 Report on the Flood Risk Management (Scotland) Bill' paras 109–17 and recommendations 13, 14, 15 <http://www.scottish.parliament.uk/s3/committees/rae/reports-09/rur09-01-vol1-1.htm> (21 January 2009).

51 See eg Defra 2005 'Making Space for Water' and subsequent related consultations and policy initiatives in England, at <http://www.defra.gov.uk/enviro/fcd/policy/strategy.htm> (13 January 2009); the English floods of 2007 also provide an indication of both the potential and the limitations of natural flood management in regions which are heavily urbanised, or where the level of flooding is very severe. (See M Pitt 'Learning Lessons from the 2007 Floods: Final Report' (2008) [http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final\\_report.html](http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html) (21 January 2009), esp paras 7.101–7.129.

52 The term NFM combines a suite of measures for management both of the land and the riparian zone to attenuate runoff, store water in the soil and riparian zone, and increase surface roughness of the catchment. NFM will therefore include activities outside the floodplain, for example on hill slopes and in tributaries. Evidence of the effectiveness of this in terms of flood risk reduction is, at present, limited. Many of the measures have not been monitored for long enough, although modelling does show benefits, particularly from planting forest to increase floodplain roughness. Current research, as well as that likely to emanate from the bill provisions, should provide better evidence in due course.

a business or a private individual who may be affected whether upstream or downstream – will have to be convinced that the scheme will work. If any of these stakeholder groups do not believe that the science behind (for example) natural flood management is sound, they are most unlikely to support the policy or the law that gives effect to that science.

Exactly the same sorts of difficulties apply to many other areas of water science under the WFD and related legislation, and under similar legislation in many states around the world.<sup>53</sup> An ecosystem approach to water quality is a highly complex activity, requiring new monitoring arrangements, new forms of assessment and multiple criteria by which to determine the quality of waters, far removed from the application of a simple chemical quality standard. The 15 years provided under the WFD for its initial implementation in Europe, which after all is far advanced in these matters, is proving to be barely enough. Like IWRM, with which it is usually linked as the same data sets and scientific understandings are likely to be required, this ecological approach is a resource-intensive process. Like IWRM, involvement of stakeholders is essential if it is to succeed, and those stakeholders (who are likely to be the same people, businesses and organisations, all of whom have finite resources) must be supportive of the process – and the science that underpins it. Here we see the value of the approach taken by the HELP programme, where the emphasis is on better communication, developing networks and building trust.

Basins such as the Tweed, and also the Dee, with effective networks in place, are ideally placed to contribute to the HELP programme. Jurisdictions such as Scotland, where IWRM is new, will benefit from global experience in shared problems. Scotland has also shown a strong regulatory lead by taking a proactive approach to the policy and law reform that establishes both IWRM and ecological quality management.

## CONCLUSION

HELP does not compete with the structures and activities required by the WFD or similar IWRM

legislation, and those structures and activities do not make HELP redundant. The WFD requires participation of at least the key interest groups beyond governments and regulators. It also requires an approach more focused on ecosystem health in the broadest sense, which in turn requires both new scientific research and better means of communicating the results of that research, to the policy-makers, the key stakeholders and the public at large, who ultimately foot the bill and whose lives and livelihoods, directly or indirectly, depend on the proper management of resources especially water.

In the developing world, these dependencies are often both direct and obvious. In the developed world, the dependency may be less direct and less well understood, but the financial consequences – of regulation, of planning processes, of changes to land-use patterns, whether driven by climate change, EC law or the global financial crisis – still impact directly and negatively on people's lives. In all parts of the world, as expert knowledge becomes more specialised and complex, individuals in different spheres struggle to share their knowledge, and the knowledge and understanding of those who are not experts may be belittled and neglected.

Both participation and communication are essential elements of HELP. The programme provides a structured mechanism to assist the various players to come together more effectively. It recognises both the 'soft' and 'hard' dimensions of water management, and the need to reconcile the two. It acknowledges the necessity for cutting-edge scientific research, for that research to be properly reflected in emerging policy and law, and the needs of non-technical groups who are affected by those policies and laws. It also provides existing networks of basins with significant expertise in many of the critical water management problems seen in basins around the world. As HELP moves into its third phase, within the seventh programme of the IHP, it will continue to provide a valuable resource and valuable inputs for all those working in this challenging but rewarding field.

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<sup>53</sup> It is important to remember that neither IWRM, nor other aspects of the WFD, are unique to Europe. The South African National Water Act, Act No 36 of 1998, for example, provides for catchment management through stakeholder-led bodies and a highly sophisticated system of ecological classification.